

REMARKS/ARGUMENTS

In the Office Action of January 16, 2004, the Examiner allowed Claims 30 and 44-49, found that Claims 32, 33 and 35-43 contain allowable subject matter and rejected Claims 15-29, 31 and 34. Applicants respectfully thank the Examiner for the finding of allowed and allowable claims. The Applicants also respectfully disagree with the rejection of Claims 15-29, 31 and 34.

Claims 15-20, 28, 29 and 31:

The Examiner rejected Claims 15-20, 28, 29 and 31 as allegedly being unpatentably obvious over US 5,658,471 (Murthy) in view of US 5,867,192 (Mantell). Applicants respectfully request that the Examiner withdraw the rejection of Claims 15-20, 28, 29 and 31 because the evidence of record does not support a prima facie case of obviousness.

In order to establish a prima facie case of obviousness, an examiner must show at least: (1) a suggestion or motivation to combine reference teachings; (2) a reasonable expectation of success; and (3) that the prior art references when combined must teach or suggest all the limitations. See MPEP § 2142-2143.3; In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). In this case, the applicant respectfully suggests that the Examiner failed to show any one of these elements.

In this case, the Examiner has not produced any evidence of a motivation to combine Murthy with Mantell. Instead, the Examiner asserts, without documentary support, that:

"the motivation for combining Mantell et al. and Murthy et al. is found that it is the generally available knowledge to one having ordinary skill in the art to use the above technique disclosed by Mantell et al. for creating

cavities in a silicon substrate such as ink/fluid feed slots in the printhead disclosed by Murthy et al. to obtain the above advantage.”

Office Action at 6. The Applicants respectfully submit that this conclusion is in error. Moreover, the Examiner provides no factual support, other taking official notice of an alleged “generally available knowledge,” for finding an alleged motivation to combine.

When an Examiner takes official notice of an alleged fact, the Examiner must provide an explicit basis on which the examiner regards the matter as subject to official notice. MPEP 2144.03C. Applicants respectfully suggest that the Examiner’s comments in the Office Action do not provide any specific facts regarding whether persons of skill in the art would combine the process for forming the channels in the side-shooter of Mantell with the process for forming the ink feed slots in the printhead of Murthy.

Applicants respectfully request that the Examiner provide an affidavit or declaration setting forth specific factual statements and an explanation to support the finding, as provided by 37 CFR 1.104(d)(2) and MPEP 2144.03.C.

Mantell does not disclose, teach or suggest at least the following limitations of independent Claims 15, 18, 28, 29:

“ . . . a plurality of fluid [(ink)] drop generators formed on a first surface of said silicon substrate”

or

“ . . . a fluid [(ink)] feed slot extending from a second surface of said silicon substrate to said first surface”

Claims 15, 18, 28, 29. The dependent claims 16-17, 19-26 and 31 introduce additional limitations which serve to further distinguish those claims over the cited references.

Mantell recites creating a "channel 16." 4:10. The channel has an "ultimate depth of the final truncated-parallelogram channel relative to the wafer surface" 4:14-16. Mantell does not disclose, teach or suggest, "a fluid feed slot extending from a second surface of said silicon substrate to said first surface . . ." as recited in Claim 15.

Murthy recites "ink feed slots 20" through a substrate 2 from a first surface 4 to a second surface 6. 6:30-36; FIGS. 1A-1G. Heating elements are formed on the second surface 6. 7:1-5. Ink passes through the ink feed slots to the heating elements on the surface. Although Murthy recites an, "ink feed slot," it does not disclose, teach or suggest, "said fluid slot formed by deep reactive ion etching followed by anisotropic wet etching, and having an opening at the first surface having a width W1 that is less than a width W2 of an opening at the second surface . . ." as recited in Claim 15.

Neither Murthy nor Mantell disclose, teach or suggest combining the "ink feed slot" of Murthy with the method of creating a channel having an ultimate depth, as shown in Mantell, to practice all of the limitations of any of claims 15-20, 28, 29 or 31.

The purported "advantage" of Mantell, that the Examiner refers to in the Office Action, is that, "the wet etching process is self-terminating." Applicants respectfully submit that this purported advantage is not applicable to the claims and that the purported advantage does not support a finding of a motivation to combine Murthy with Mantell.

In fact, Mantell teaches away from being combined to with a technique that is "self limiting" as stated at page 6 of the Office Action. Murthy discloses that "the silicon substrate is anisotropically etched from the first surface to the dielectric layer 10 on the second surface of the substrate thereby forming feed slots 20," and then "any remaining blanket protective coating 50 on the second surface may then be removed using wet or dry etching techniques thereby completing the ink feed slots through the substrate 2." (Col. 10, ll. 23-30). As such, the purpose of Murthy is to create a slot that goes through a substrate.

A self limiting etching process as disclosed in Mantell, is designed to terminate without forming a slot through the process. See, (Col. 4, ll. 1-5). Specifically, the "ultimate depth of the final truncated-parallelogram channel relative to the wafer surface is dependent on the depth of the reactive ion etch and the width of the opening in the mask 20." (Col. 4, ll. 15-18). This clearly indicates that the self-limiting process of Mantell would not function to create "ink feed slots through the substrate 2" which is the purpose of Murthy.

Therefore, Applicants respectfully submit that the Murthy teaches away from the use of a self-limiting etching process as disclosed by Mantell. For at least this reason, the combination of Murthy and Mantell must be withdrawn.

In addition, Applicants respectfully submit that the applying the "self limiting etching process of Mantell to Murthy would render Murthy as being unable to form "ink feed slots through the substrate 2" which is the purpose of Murthy. Therefore, Applicants respectfully submit that the combination of Mantell to Murthy would render Murthy unsatisfactory for its intended purpose and must be withdrawn. See, MPEP 2143.

Claims 21-27 and 34:

The Examiner rejected Claims 21-27 and 34 as allegedly being unpatentably obvious over Murthy in view of Mantell and further in view of US 6,143,190 (Yagi). Applicants respectfully submit that the Examiner should withdraw the rejection for reasons similar to those given above, with respect to Claims 15-20, 28, 29 and 31. The Examiner has failed to establish a prima facie case of obviousness and has not provided evidence of a motivation to combine Mantell with either one of Murthy or Yagi.

None of Mantell, Murthy or Yagi, alone or in combination, disclose, teach or suggest all of the limitations of any of Claims 21-27 or 34. Specifically, they do not disclose, teach or suggest at least the following limitations:

“ . . . a plurality of fluid [(ink)] drop generators formed on a first surface of said silicon substrate”

or

“ . . . a fluid [(ink)] feed slot extending from a second surface of said silicon substrate to said first surface”

Claims 21-27 and 34 each include additional limitations which serve to further distinguish the Claims over the cited references.

Yagi recites a method of producing a through-hole in a silicon substrate to form a fluid feed slot. A heating resistor 103 is formed on a surface of the substrate. 20:16-17; FIG. 18B. The Examiner has not provided any specific documentary evidence supporting a motivation to combine Yagi with Mantell.

CONCLUSION

For the foregoing reasons, Applicants respectfully request that the Examiner withdraw the rejections and place all of the claims in condition for allowance. In the event that the Examiner does not withdraw the rejections, Applicants respectfully request that the Examiner provide an affidavit or declaration setting forth specific factual statements and an explanation to support the finding of a motivation to combine Yagi with Mantell and Murthy, as provided by 37 CFR 1.104(d)(2); MPEP 2144.03.C.

Respectfully submitted,

A handwritten signature in dark ink, appearing to be 'Peter Reitan', enclosed within a large, loopy oval shape.

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